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A Harbour Porpoise, *Phocoena phocoena* (Linnaeus, 1758), from the Mackenzie River delta, Northwest Territories, Canada (Notes on Cetacea, Delphinoidea VIII)

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ABSTRACT

A Harbour Porpoise, *Phocoena phocoena*, taken from near Shallow Bay, Mackenzie River Delta, Northwest Territories (68°48' N 136°35' W) in July 1973 represents a range extension 800 km eastwards from the previous extreme northeastern record on the north Alaskan coast.

All 12 Harbour Porpoises so far examined from either the extreme north of the range of the species in the eastern North Pacific Ocean, or from the extreme south of the range in the eastern North Pacific and eastern North Atlantic Oceans, are large animals.

OBSERVATIONS AND IDENTIFICATION

In July 1973 a Harbour Porpoise (*Phocoena phocoena*) was shot and killed by an Inuit hunter from Aklavik, in the Moose Channel, 12 km south of Shallow Bay (approx. 68°48' N, and 136°35' W) in the Mackenzie River delta, Northwest Territories, Canada.

Two porpoises were seen swimming and leaping out of the water together. The hunter fired and killed one, but the porpoise sank. Several weeks later the carcass was found washed up on shore. The head, flippers, flukes, and dorsal fin were removed and kept in an ice house until 17 September, 1974 when the skull was given to Hoek. It was sent to van Bree, who identified it as that of *Phocoena phocoena* (Linnaeus, 1758).

While studying the skull of this animal, we were struck by the great resemblance in skull dimensions between large Harbour Porpoises and full-grown Dall's Porpoises, *Phocoenoides dalli* (True, 1885), as shown in tables I and II. It was this resemblance that caused us some difficulties in identifying the skull. The differences in skull morphology were well expressed by True (1889: 124) while discussing *P. dalli*:

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Fig. 2. Lateral aspects of calvaria of *Phocoenoides dalli* (at left) and of *Phocoena phocoena* (at right). For particulars, see legend of Fig. 1. [99]

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"The skulls of *P. dalli* are remarkable for their short, flat beaks and great breadth between the orbits. The intermaxillae are higher in front of the nares than in *P. communis* [= *P. phocoena*], and nearly flat superiorly. The triangular area in front of the nares is raised above the level of the surrounding surface and the foramina on either side do not open into deep, narrow grooves as they do in *P. communis*. The intermaxillae are separated at their inner margins by a wide space, and at the bottom of the trough the vomer is plainly visible. The region of the skull between the nares and the occipital crest is nearly at right angles with the plane of the beak. The nasal bones have the form of two transverse, prominent bosses. The occipital bone is exceedingly large and broad, as compared with that of *P. communis*; the temporal fossae are small, and the squamosals are short and thick. The nares, both superior and inferior, are very large."

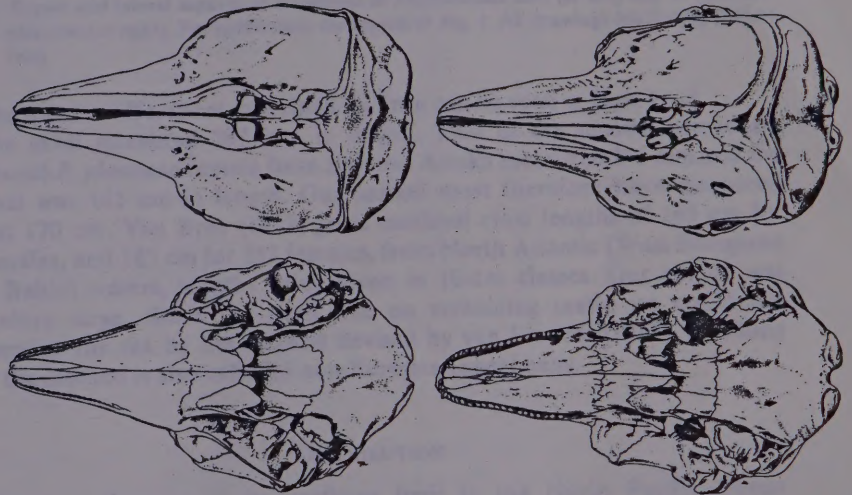


Fig. 1. Dorsal and ventral aspects of calvaria of *Phocoenoides dalli* and of *Phocoena phocoena*. At left *P. dalli*, ZMA 6063 (sex ?, caught N.E. of Japan, 1963, leg. M. Nishiwaki), at right *P. phocoena*, ZMA 8474 (♀, stranded on the island of Terschelling, the Netherlands, 18-VII-1965, leg. H. J. de Feyfer).

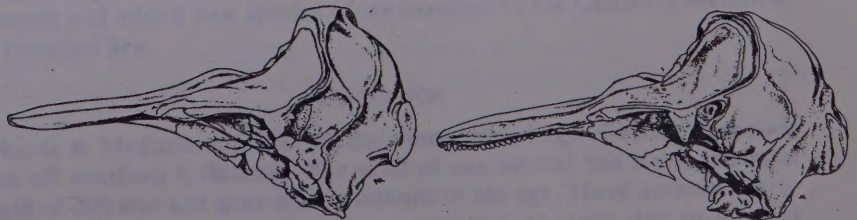


Fig. 2. Lateral aspects of calvaria of *Phocoenoides dalli* (at left) and of *Phocoena phocoena* (at right). For particulars, see legend of Fig. 1.

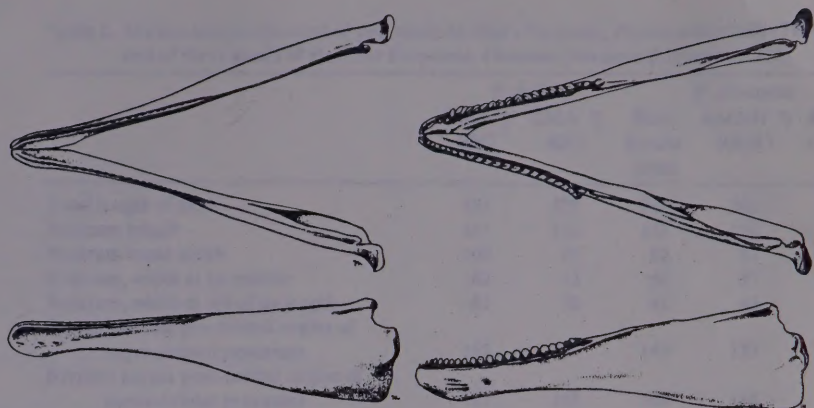


Fig. 3. Dorsal and lateral aspects of mandibles of *Phocoenoides dalli* (at left) and of *Phocoena phocoena* (at right). For particulars, see legend of Fig. 1. All drawings Jos Ruting (ZMA) fecit.

The species differences described by True can be seen in Figs. 1—3.

The skull measured 297 mm in length. That of the nearest previously collected *P. phocoena* female from Barrow, Alaska measured 291 mm and the animal was 162 cm in length. Our animal must therefore have measured about 170 cm. Van Bree (1973) gives maximal class lengths of 165 cm for 296 males, and 185 cm for 357 females, from North Atlantic (West European and Baltic) waters, lengths being given in 10-cm classes. Our animal was therefore large. Since the skull had no remaining teeth, we could not determine the sex by the method devised by van Utrecht (1969), assuming that the method is also valid for non-European specimens.

DISTRIBUTION

Phocoena phocoena at its northern limit in the North Pacific Ocean regularly reaches north Alaskan waters (see map in Gaskin *et al.* 1974), and has been previously recorded east to Point Barrow where an adult female and, a few days later, a newborn calf were taken in August 1952 (Hall & Bee 1954). The present record therefore represents a range extension 800 km eastward and adds a new species of sea mammal to the Canadian section of the Beaufort Sea.

DISCUSSION

Norris & McFarland (1958: 35) described three large Harbour Porpoises from off southern California. The skull of one animal had a condylobasal length of 290 mm and gave other evidence of old age. These authors stated: "These records seem to represent an extension of range due to unusual conditions, as the species is not a common resident until one goes

Table 1. Measurements (in mm) of two skulls of Dall's Porpoise, *Phocoenoides dalli* (True, 1885) and of three skulls of Harbour Porpoises, *Phocoena phocoena* (Linnaeus, 1758).

	<i>P. dalli</i>		<i>P. phocoena</i>		
	ZMA ¹⁾ 6062	ZMA ¹⁾ 6063	Mac- kenzie delta	AMNH ²⁾ 100387	KB- ³⁾ 16—72
Total length of skull	331	329	297	302	261
Rostrum length	141	132	131	128	114
Rostrum basal width	103	95	82	83	67
Rostrum, width at its middle	62	53	56	57	45
Rostrum, width at 3/4 of its length	42	36	41	43	—
Breadth across pre-orbital angles of supra-orbital processes	162	164	145	133	116
Breadth across post-orbital angles of supra-orbital processes	187	186	168	165	141
Zygomatic width	190	188	182	—	145
Width of braincase across parietals	170	175	145	140	127
Maximum width of premaxillae	53	49	39	37	33
Length temporal fossa	48	47	46	52	42
Height temporal fossa	31	37	41	52	32
Tip rostrum-nares	182	178	171	164	140
Length of upper toothrow (right side)	122	110	117	120	97
Length of upper toothrow (left side)	122	110	115	120	97
Tip rostrum-pterygoid	211	196	186	185	165
Length mandible	263	250	233	—	202
Height mandible at coronoid	64	61	61	—	45
Symphysis mandibles (length)	36	26	27	—	28
Length of lower toothrow (right side)	126	108	104	—	101
Length of lower toothrow (left side)	124	108	104	—	101

¹⁾ Zoological Museum, Amsterdam²⁾ American Museum of Natural History³⁾ Collected by Kenneth Balcom; in collection of W. F. Perrin, La Jolla

northwards to the vicinity of San Francisco Bay" and: "It is our feeling that these range extensions represent old animals that have wandered far beyond their normal range."

In discussing the skulls of five Harbour Porpoises caught off Senegal and one from off Mauretania, West Africa, Fraser (1958) noted the exceptionally large size of the skulls of these animals. Condylbasal skull lengths of these five animals ranged from 280 to 300 mm (see his table I). Studies of the structure and number of the teeth, and of relative growth of the skulls, showed that these southern animals resembled typical northeast Atlantic *P. phocoena*, although the localities were somewhat to the south of the normal range.

Fraser, who had seen Norris & McFarland's paper in press, also deduced that the large West African specimens were old animals that had wandered south of their normal range ¹⁾.

¹⁾ D. E. Gaskin (in litt.), however, records a skull from Mauretania (BMNH 1968.1.12.1) of length 246 mm.

Table II. Dimensions in percentages of the condylobasal lengths (total lengths of skulls) of two skulls of *Phocoenoides dalli* and three skulls of *Phocoena phocoena*. See also table I.

	<i>P. dalli</i>		<i>P. phocoena</i>		
	ZMA 6062	ZMA 6063	Mac- kenzie delta	AMNH 100387	KB- 16-72
Total length of skull	100.0	100.0	100.0	100.0	100.0
Rostrum length	42.6	40.1	44.1	42.4	43.7
Rostrum basal width	31.1	28.9	27.6	27.5	25.7
Rostrum, width at its middle	18.7	16.1	18.9	18.9	17.2
Rostrum, width at 1/4 of its length	12.7	10.9	13.8	14.2	—
Breadth across pre-orbital angles of supra-orbital processes	48.9	49.8	48.8	44.0	44.4
Breadth across post-orbital angles of supra-orbital processes	56.5	56.5	56.6	54.6	54.0
Zygomatic width	57.4	57.1	61.3	—	55.6
Width of braincase across parietals	51.4	53.2	48.8	46.4	48.7
Maximum width of premaxillae	16.0	14.9	13.1	12.3	12.6
Length temporal fossa	14.5	14.3	15.5	17.2	16.1
Height temporal fossa	9.4	11.2	13.8	17.2	12.3
Tip rostrum - nares	55.0	54.1	57.6	54.3	53.6
Length of upper toothrow (right side)	36.8	30.4	39.4	39.7	37.2
Length of upper toothrow (left side)	36.8	33.4	38.7	39.7	37.2
Tip rostrum - pterygoid	63.7	59.6	62.6	61.3	63.2
Length mandible	79.4	76.0	78.4	—	77.4
Height mandible at coronoid	19.3	18.5	20.5	—	17.2
Symphysis mandibles (length)	10.9	7.9	9.1	—	10.7
Length of lower toothrow (right side)	38.0	32.8	35.0	—	38.7
Length of lower toothrow (left side)	37.5	32.8	35.0	—	38.7

The northernmost Pacific records of Harbour Porpoises also represent exceptionally large animals. For typical controls two female specimens of *P. phocoena* from Long Beach, Pacific Beach, and Iron Springs (47°09' N, 124°11' W), Washington State, USA measured 132.5 cm and 147 cm; three males 112, 113 and 133 cm, lengths which are commonly encountered. The skull of ♀ KB 16—72 from among this group, and included in table I, measured 261 mm in total length. But a Harbour Porpoise skull (AMNH 100387) from Yukon Island, Alaska (50°31' N, 151°30' W) has a length of 302 mm. A second, very badly damaged skull (AMNH 100388) from the same locality has a length of 280 mm. Although these are archaeological finds from Indian mounds we assume that they are valid for comparison provided that the climate has not radically changed. The total length of the skull of the female specimen of *P. phocoena* (USNM 294800) from Elson Point, Point Barrow, Alaska (71° N, 156° W), already mentioned above is 291 mm and, lastly, the skull from the Mackenzie River delta (69° N, 136° W) has a total length of 297 mm. With the exception of the first, all these values of skull length are reached only by old specimens.

Thus, although all three samples described from the extremes of the range

are small, totalling 5 from Africa, 3 from California and 4 from northern Alaska and Mackenzie, or 12 animals in all, it seems likely that mainly large adult Harbour Porpoises move to the northern and southern extremities of the species' range. The second, small Harbour Porpoise taken at Barrow in August 1952 was a newborn calf which does not invalidate this conclusion.

ACKNOWLEDGEMENTS

Mr R. M. Hill of the Inuvik Research Laboratory told W. Hoek about the Mackenzie River porpoise; Mr Harry Gordon of Aklavik, Northwest Territories hunted it and kept the material for identification. To these people we are very grateful. We express also our sincere thanks for information, or availability of other porpoise material, to: Dr Sydney Anderson and Marie A. Lawrence, American Museum of Natural History; Dr James G. Mead, United States National Museum; Dr William F. Perrin, National Marine Fisheries Service, La Jolla, California; Mr D. B. Yurick, College of Biological Sciences, University of Guelph, Ontario; and Mr Kenneth Balcolm, Moclips Cetological Society, Moclips, Washington. Dr D. E. Gaskin, University of Guelph, Ontario, made useful criticisms of the manuscript.

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